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Marketing Research Report No. 382

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# Analysis of Retail Display Methods for Mayonnaise and Salad Dressing

A STUDY IN THE MARKETING OF FATS AND OILS

Market Development Research Division
Agricultural Marketing Service
U. S. DEPARTMENT OF AGRICULTURE

## PREFACE

The study described in this report was designed to test the effect on sales of various arrangements of mayonnaise and salad dressing within a given shelf display area in retail stores. The findings seem encouraging enough to indicate that further work in this field might lead to the establishment of merchandising principles applicable not only to mayonnaise and salad dressing but to other commodities as well. Conclusions given in this report are based on consumers' reactions to display methods of the type now being used in retail food stores. This research is part of a broad program to provide producers, distributors, and retailers of farm products with information helpful in expanding sales and increasing marketing efficiency. Large quantities of vegetable oil and egg products are used in mayonnaise and salad dressing.

The study was made possible through the cooperation of Stop and Shop, Inc., Boston, Mass., which permitted the use of 12 supermarkets as laboratories.

This research was under the general direction of George H. Goldsborough.

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February 1960

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# ANALYSIS OF RETAIL DISPLAY METHODS FOR MAYONNAISE AND SALAD DRESSING

## A Study in the Marketing of Fats and Oils

By Nick Havas, marketing specialist, and Hugh M. Smith, agricultural economist
Market Development Research Division
Agricultural Marketing Service

## SUMMARY

Total sales of mayonnaise and salad dressing during a merchandising test in Boston, Mass., were greatest when these products were displayed on the lower four shelves of a five-shelf display case. Variations in arrangements of different brands and container sizes on these four shelves did not affect sales.

These are among the results of a 16-week controlled experiment in 12 Boston supermarkets. Four different methods of displaying mayonnaise and salad dressing were tested. The two methods utilizing the lower four shelves resulted in significantly higher sales than the other two methods, in which the displays occupied the three lower shelves and the top shelf, or all five shelves. There was a probability of 9 in 100 that the difference in sales might have been due to chance.

Total sales of brand A mayonnaise and salad dressing were significantly greater when all container sizes of this brand were displayed on a single shelf than when mixed with other brands on all shelves. Display on the third or fourth shelf gave better sales results than display on the fifth shelf (counting the bottom shelf as the first). Sales were slightly greater on the third than on the fourth shelf, but the probability was more than 20 in 100 that this difference might have been due to chance.

Additional findings not directly related to the controlled experiment indicated that mayonnaise occupied 63 percent of the total space and accounted for 63 percent of total sales of the two products. Similarly, salad dressing occupied 37 percent of the display area and accounted for 37 percent of sales. However, when the movement of selected brands of mayonnaise and salad dressing was related to the lineal feet of display each occupied, this ratio did not hold. It was found, for example, that brand A mayonnaise occupied 33 percent more of total mayonnaise display than its share of the sales, while brand E had sales 21 percent in excess of its share of the display. Similarly, for salad dressing, brand A occupied 56 percent more of total salad dressing display than its share of the sales while brand D sold 23 percent more than its allotted share of the display.

By container sizes, sales of salad dressing in quarts were larger in proportion than the display space occupied, while a 1-to-1 ratio existed between sales and display space for quarts of mayonnaise. Pint sales of both mayonnaise and salad dressing were larger in proportion than the display space occupied. However, half pints of each commodity occupied twice as much space as their percentage share of sales.

Although quantities sold per lineal foot were equal for mayonnaise and salad dressing, mayonnaise grossed $3 more per lineal foot than salad dressing due to higher price per pound. The range in returns per lineal foot among the five brands of mayonnaise was wide, extending from slightly over $10 to over $19 per lineal foot of space occupied. The range was even greater for salad dressing--from slightly over $7 to over $15 per lineal foot of display. A small part of the difference between brands was due to price differences.

When dollar sales were analyzed by container size, it was found that pints were most productive, grossing over $17 per lineal foot of display. Quarts grossed around $12.50 and half pints $9 per lineal foot.

## BACKGROUND AND PROCEDURE

Over the past two decades, the total as well as per capita consumption of commercially produced mayonnaise and salad dressing and related products (french dressing, sandwich spread, and other semisolid and liquid types of dressings) has been increasing steadily. 1/ In 1939, the annual production of these foods was less than 42 million gallons and per capita consumption was approximately 2.5 pints. By 1958, total annual production exceeded 125 million gallons, and per capita consumption had increased to 5.8 pints. Production in 1958 was divided as follows: Salad dressing, 43.8 percent; mayonnaise, 40.2 percent; french dressing, 6.5 percent; sandwich spread, 5.5 percent; and other semisolid and liquid types of dressings, 4.0 percent.

Large quantities of vegetable oils are used in the manufacture of mayonnaise and salad dressing and related products. The Food and Drug Administration requires a minimum oil content of 65 percent by weight for mayonnaise, 30 percent for salad dressing, and 35 percent for french dressing. 2/ Of the more than 568 million pounds of vegetable oils utilized in 1958 for commercial production of these items, 69 percent was soybean oil, 27 percent cottonseed oil, and 4 percent corn and other vegetable oils.

Commercial producers of mayonnaise and salad dressing constitute an important outlet for egg products also. Trade sources indicate that mayonnaise contains an average of 7 percent egg yolk, while salad dressing normally contains about 4 percent. These percentages represent more than

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1/ U. S. Dept. Commerce. Salad Dressing, Mayonnaise, and Related Products, 1958. Business & Defense Serv. Admin. June 1959.

2/ U. S. Dept. Health, Ed., & Welfare. Dressings for Foods--Mayonnaise, French Dressing, Salad Dressing: Definitions and Standards under the Federal Food, Drug, and Cosmetic Act. Food & Drug Admin. Serv. & Regulat. Announc., Food, Drug, & Cosmetic No. 2, Part 25. Reprinted June 1957.

44.5 million pounds of egg yolk in commercially produced mayonnaise and salad dressing in 1958. In shell egg equivalent, this quantity of yolk is equal to more than 78.5 million dozen whole eggs or nearly 1.6 percent of an estimated annual egg production of over 5 billion dozens. 3/

The objectives of the study were to determine (1) the effect on total sales of mayonnaise and salad dressing of selected display arrangements by brand, container size, and shelf levels, and (2) the effect of shelf location and container size arrangements on sales of a selected brand of mayonnaise and salad dressing.

Sales of mayonnaise and salad dressing displayed were recorded by brand and container size in 12 food supermarkets for a 16-week period. 4/ The different merchandising methods were identified as I, II, III, and IV and are described below. Five brands were included in the various displays and are identified by the letters A through E. Both mayonnaise and salad dressing of brands A and D were displayed; mayonnaise only of brands B, C, and E. Brand A was the selected test brand and occupied different shelves of a five-shelf grocery display case in each method. The shelves are identified by number ranging from 1 to 5 with shelf 1 being the bottom shelf. The four display arrangements are shown in figures 1 to 4.

Method I, regular shelf display.--Mayonnaise and salad dressing occupied the three lower shelves plus the top shelf (fig. 1). Shelf 4 was used to display other closely related grocery items, including french and italian dressing, other oils, dehydrated dressings, and sandwich spreads. This method of display was used by the test stores prior to the merchandising test; therefore, it was considered the control or standard method. All sizes of brand A were located on the top shelf. Each of the other shelves contained several brands. Shelf 3 held half-pints, shelf 2 held pints, and shelf 1 held quarts.

Method II, modified regular display.--All containers of brand A mayonnaise and salad dressing were on shelf 3 (fig. 2). Half-pint containers of other brands were on shelf 4. As in method I, shelf 2 held pints and shelf 1 held quarts of several brands.

Method III, display arranged by size.--Mayonnaise and salad dressing (all brands, including brand A) were arranged with half-pints on the fifth shelf, pints on the fourth and third shelves, and quarts on the second and first shelves (fig.3). Of the four merchandising methods tested, this was the only method in which test products were displayed on all five grocery shelves.

Method IV, display arranged by brand.--Test products were arranged with brand A on the fourth shelf, brands B and C on the third shelf, brand D on the second shelf, and brand E on the bottom shelf (fig. 4). The container sizes of brand A were in the same order as in methods I and II.

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3/ U. S. Dept. Agr. Chickens and Eggs--Farm Production, Disposition, Cash Receipts, Gross Income, by States, 1957-58. Pou. 2-3(59). Agr. Mktg. Serv., Crop Rptg. Bd. April 1959.

4/ French dressings, sandwich spreads, and other semisolid and liquid dressings were excluded from the test.

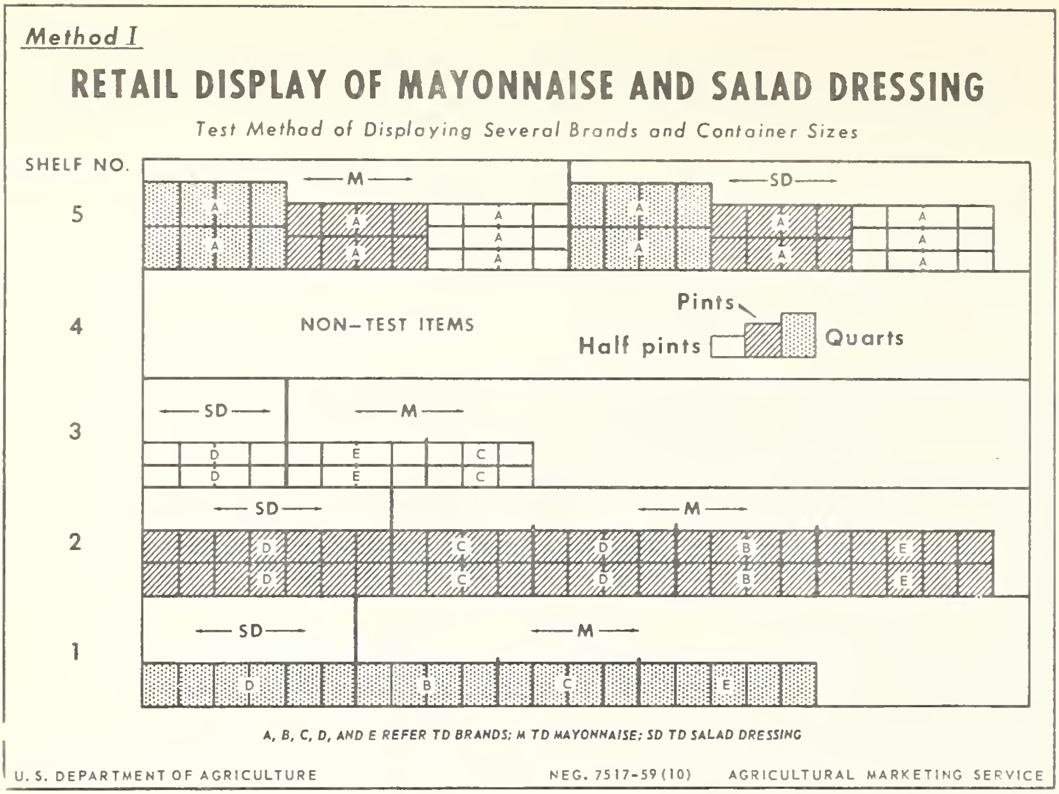
Method I
RETAIL DISPLAY OF MAYONNAISE AND SALAD DRESSING
Test Method of Displaying Several Brands and Container Sizes
SHELF NO.
5
4
3
2
1
M
SD
A
NON-TEST ITEMS
Pints
Half pints
Quarts
D
E
C
B
A, B, C, D, AND E REFER TO BRANDS; M TO MAYONNAISE; SD TO SALAD DRESSING
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Figure 1

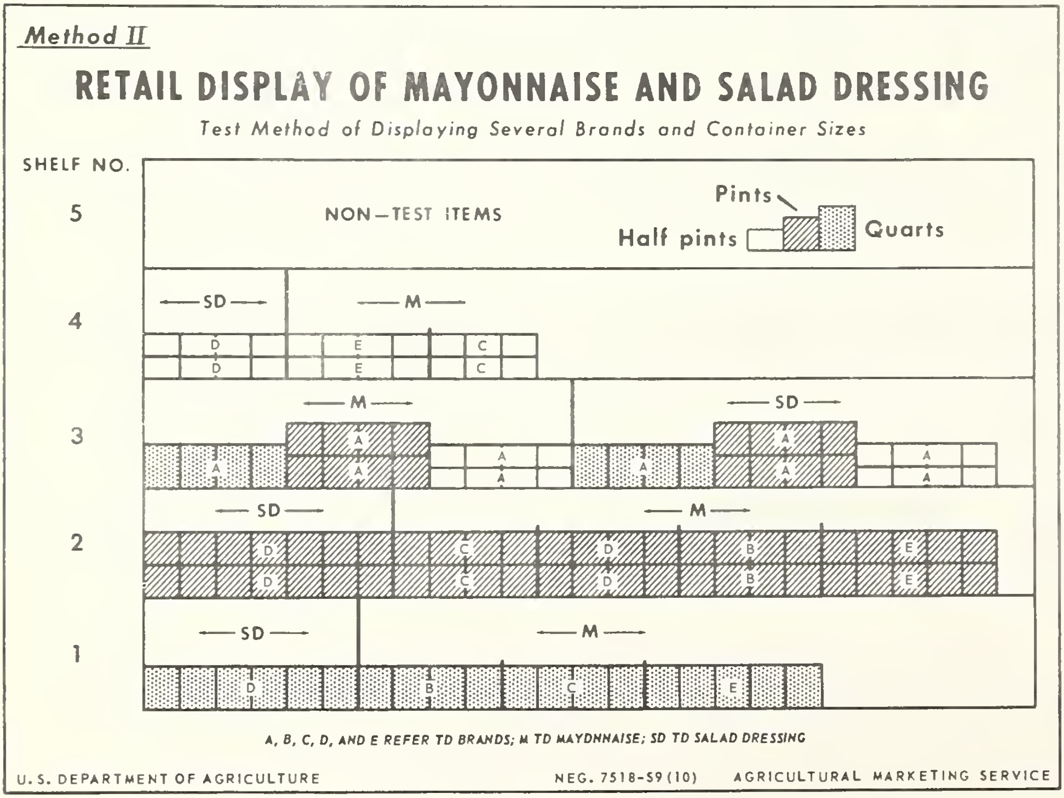
Method II
RETAIL DISPLAY OF MAYONNAISE AND SALAD DRESSING
Test Method of Displaying Several Brands and Container Sizes
SHELF NO.
5
4
3
2
1
NON-TEST ITEMS
Pints
Half pints
Quarts
SD
M
D
E
C
A
B
A, B, C, D, AND E REFER TO BRANDS; M TO MAYONNAISE; SD TO SALAD DRESSING
U. S. DEPARTMENT OF AGRICULTURE
NEG. 7518-59 (10)
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Figure 2

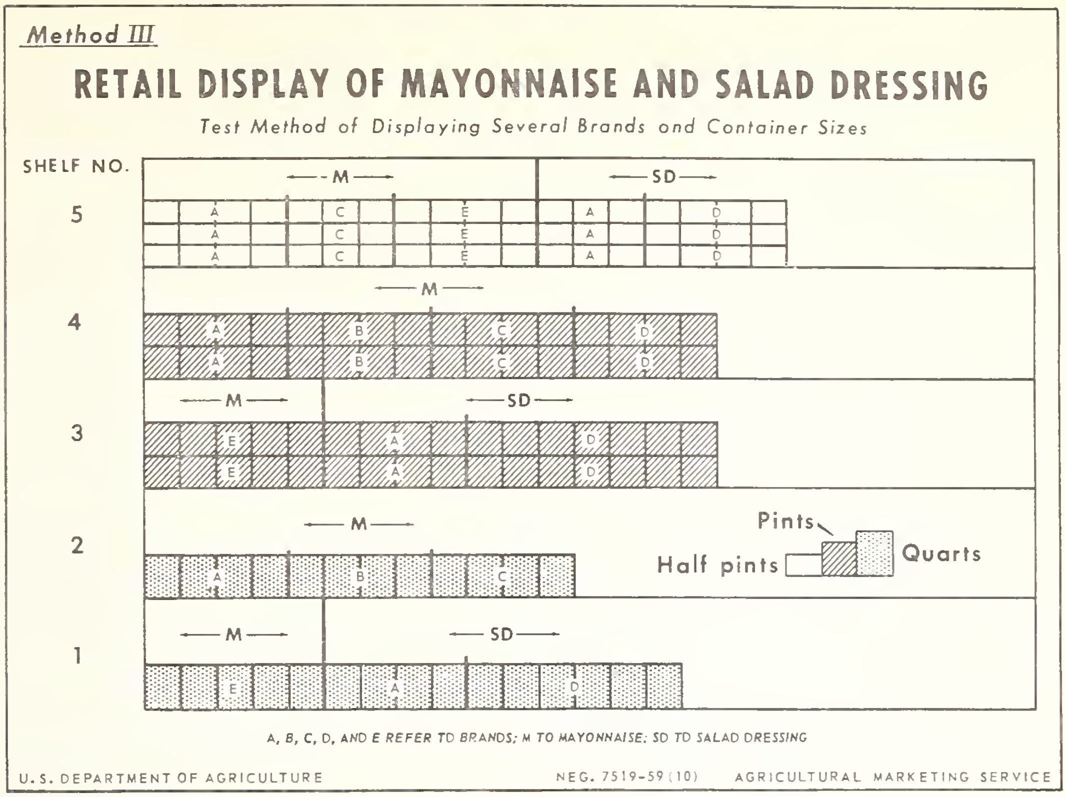

Method III
RETAIL DISPLAY OF MAYONNAISE AND SALAD DRESSING
Test Method of Displaying Several Brands and Container Sizes
SHELF NO.
5
M
SD
A
C
E
A
D
4
M
A
B
C
D
3
M
SD
E
A
D
2
M
A
B
C
Pints
Half pints
Quarts
1
M
SD
E
A
D
A, B, C, D, AND E REFER TO BRANDS; M TO MAYONNAISE; SD TO SALAD DRESSING
U.S. DEPARTMENT OF AGRICULTURE
NEG. 7519-59 (10)
AGRICULTURAL MARKETING SERVICE

Figure 3

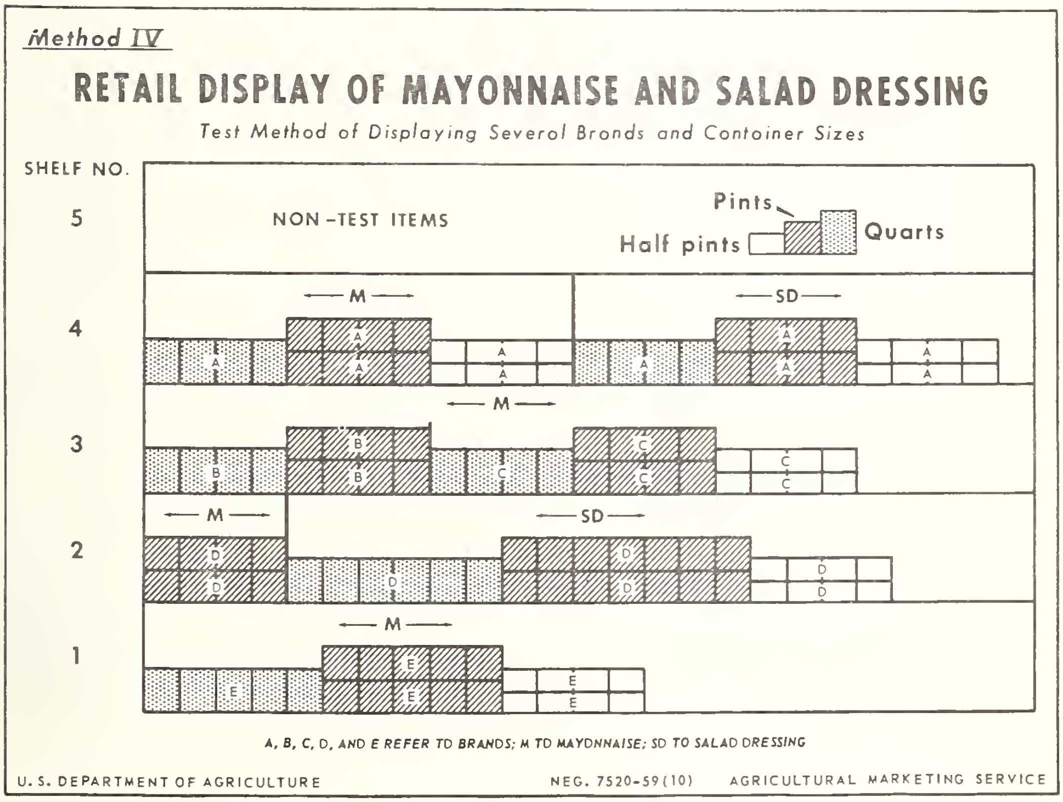

Method IV
RETAIL DISPLAY OF MAYONNAISE AND SALAD DRESSING
Test Method of Displaying Several Brands and Container Sizes
SHELF NO.
5
NON-TEST ITEMS
Pints
Half pints
Quarts
4
M
SD
A
3
M
B
C
2
M
SD
D
1
M
E
A, B, C, D, AND E REFER TO BRANDS; M TO MAYONNAISE; SD TO SALAD DRESSING
U.S. DEPARTMENT OF AGRICULTURE
NEG. 7520-59 (10)
AGRICULTURAL MARKETING SERVICE

Figure 4

Twelve New England supermarkets, each with annual gross sales of $1 million or more, were selected as laboratories for testing the four merchandising methods. All stores in the test were under a central management which made it possible to maintain uniform prices in all stores for each brand and size of mayonnaise and salad dressing. The test stores also stocked about the same number and types of substitute items.

Each of the test stores displayed the same number of brands and sizes of mayonnaise and salad dressing throughout the test period. The number of facings (rows) for each brand and size was fixed in each store; therefore, total display space was equalized for all methods tested. Each merchandising method was in effect in a group of three stores for 4 weeks and rotated among the groups of stores at the end of each 4-week period until all 4 methods had been tested for an equal length of time in each of the 12 sample stores. This rotation tends to equalize the influence of store and time differences on sales.

Mayonnaise and salad dressing price changes during test weeks occurred simultaneously in all 12 test stores. The direct effect on sales of mayonnaise and salad dressing promotions by the cooperating retail chain was eliminated during the 16 test weeks by discontinuing the experiment during weeks when a test item was advertised or promoted, and resuming the test the week following. Because of this requirement, the test weeks were not always contiguous.

The analysis of variance test was employed to determine the confidence levels of the sales differences observed among the four merchandising methods tested. While this test indicated that sales differences among the four test methods were not significant at the 5 percent level, further analysis using the direct comparison technique was useful to determine whether any one of the four methods might have been significantly different at some lower level. The comparisons were not independent, hence the probabilities are not.

Several sets of comparisons were made and in each case a sales difference not exceeding the 20 percent probability level was considered significant. This wider latitude was considered to be acceptable because the costs of using any of the four methods tested were estimated to be about equal; consequently, no particular risk would be involved in experimenting with the different methods.

## FINDINGS

### Results of Controlled Experiments

#### Total Sales by Selected Methods

Methods II and IV, each of which utilized the four lower shelves, produced greater total sales than method I, which utilized the lower three shelves and the top shelf, and method III in which the display occupied all five shelves (table 1). Sales from methods II and IV were almost identical in quantity and slightly exceeded 34,000 pounds each. Sales from methods I and III were also approximately equal but about 1,500 pounds less than method II or IV.

Table 1.--Sales of mayonnaise and salad dressing by selected merchandising methods in 12 food supermarkets, Boston, Mass., 16-week merchandising test in 1957

| Merchandising method 1/ | Sales | Percentage of method I |
|---|---|---|
| | Pounds | Percent |
| I | 32,604 | 100 |
| II | 34,078 | 105 |
| III | 32,381 | 99 |
| IV | 34,031 | 104 |

1/ See figures 1 to 4 for exact arrangement of products in each method.

The statistical significance of the observed sales differences, as presented in the following pages, was determined by the direct comparison technique. In this technique, merchandising methods having clear similarities are grouped for comparison with other methods or are compared individually with a selected method or groups of methods. The comparisons made by this technique indicate that the differences between methods II and IV combined and methods I and III combined are significant at a probability level of 9 percent, or the chances are 9 out of 100 that the observed sales differences might have been due to chance variation (table 2).

It is concluded that the sales advantage observed in the two methods using the lower four shelves was primarily due to shelf levels rather than to size or brand arrangement of test items. This conclusion is based on the following observations:

(1) Methods I and II, in which test products were arranged identically by brand and container size on each of four shelves, but different shelves for each method, resulted in significantly different sales in favor of method II which utilized the lower four shelves.

(2) Methods II and IV, both using the lower four shelves, but differing considerably in brand and size arrangement on each shelf, resulted in equal sales.

(3) Method III used all five shelves and differed from all other methods with respect to arrangement; sales from this method were significantly less than sales from either of the two methods that occupied the lower four shelves only.

Table 2.--Direct comparisons of sales of mayonnaise and salad dressing from 4 merchandising methods to determine the significance of the sales differences observed between methods, 12 food supermarkets, Boston, Mass., 16-week merchandising test in 1957 1/

| Merchandising methods compared 2/ | Number of times out of 100 that the sales differences observed might have been due to chance alone |
|---|---|
| | Number |
| Average sales from methods II and IV were greater than average sales from methods I and III | 9 |
| Average sales from methods II and IV were greater than sales from method III | 13 |
| Average sales from methods II and IV were greater than sales from method I | 18 |
| Sales from method II were greater than sales from method I | 14 |
| Sales from method I were greater than sales from method III | 3/ |
| Sales from method II were greater than sales from method IV | 3/ |

1/ Direct comparisons were made between selected groupings of the 4 merchandising methods tested in order to compare effectiveness of display types having clear similarities.

2/ See figures 1 to 4 for exact arrangement of products in each method.

3/ Not significantly different at the 20 percent probability level.

## Effect of Shelf Location on Sales of a Selected Brand

Separate sales records were maintained for brand A mayonnaise and salad dressing for each of the four merchandising methods tested (table 3). In three of the methods (I, II, and IV), all containers of the selected brand were displayed on a single shelf in identical order as to container size, while in method III the containers were arranged by size on all five shelves. The selected brand was displayed on the fifth shelf in method I, on the third shelf in method II, and on the fourth shelf in method IV. In method III, the selected brand was displayed throughout all five shelves with half-pints on the top shelf, pints on the fourth and third shelves, and quarts on the second and first shelves (see figure 1 for brand location and order of container sizes).

The analysis revealed the following:

(1) Sales of the selected brand of mayonnaise and salad dressing were greater when displayed together on one shelf (methods I, II, and IV) than when displayed on all five shelves (method III, table 3). The probability is 11 out of 100 that the sales differences observed between the single and multiple shelf display arrangements tested might have been due to chance alone (table 4).

(2) Sales of the selected brand of mayonnaise and salad dressing, when displayed together on the third or fourth shelf (methods II and IV), were greater than sales when the items were displayed together on the top shelf (method I). The probability is about 19 out of 100 that the sales difference observed might have been due to chance alone.

(3) Actual sales of the selected brand of mayonnaise and salad dressing when displayed on the third shelf were somewhat greater than when displayed on the fourth shelf. However, tests of significance indicate that this sales difference might have been due to chance; therefore, it is reasonable to assume that shelf 3 or 4 would be equally effective.

## Additional Observations

In the course of conducting the controlled experiment described above, a substantial amount of related data were collected. These data, though not bearing directly on the controlled tests, yielded additional findings relative to the merchandising of mayonnaise and salad dressing.

### Effect of Shelf Location on Sales of Selected Container Sizes, Brand E

During the experiment, the pints and half pints of brand E mayonnaise were displayed on two of the top four shelves in three of the merchandising techniques (methods I, II, and III); however, the combination of shelves used was different in each of three techniques (figs. 1-3). In the fourth technique, when arranged by brand, all sizes of brand E were displayed on the bottom shelf and sales decreased 5 percent for pints and 19 percent for half pints with no significant change in sales of quarts which were displayed on the bottom shelf during all time periods.

These data tend to indicate (1) that the bottom shelf is not as effective as the other levels for the smaller containers, or (2) that customers require longer than 4 weeks to become accustomed to finding such container sizes on the lowest shelf, normally reserved for larger sizes by the cooperating retailer.

Table 3.--Sales of a selected brand of mayonnaise and salad dressing when displayed in various shelves in 12 food supermarkets, Boston, Mass., 16-week merchandising test in 1957

| Display location of selected brand and merchandising methods 1/ | Sales | Percentage of method I |
|---|---|---|
| | Pounds | Percent |
| Top shelf (method I) | 6,611 | 100 |
| Third shelf (method II) | 7,176 | 109 |
| All 5 shelves (method III) | 6,413 | 97 |
| Fourth shelf (method IV) | 6,839 | 103 |

1/ See figures 1 to 4 for exact arrangement of products in each method. The number of facings for each size displayed (quarts, pints, and half-pints) remained the same in each of the 4 display positions. Container sizes were in identical order in methods I, II, and IV.

Table 4.--Direct comparisons of sales of brand A mayonnaise and salad dressing from 4 merchandising methods to determine the significance of the sales differences observed between methods, 12 food supermarkets, Boston, Mass., 16-week merchandising test in 1957 1/

| Merchandising methods for comparing sales of brand A 2/ | Number of times out of 100 that the sales differences observed might have been due to chance alone |
|---|---|
| | Number |
| Average sales from methods I, II, and IV were greater than sales from method III | 11 |
| Average sales from methods II and IV were greater than sales from method I | 19 |
| Sales from method II were greater than sales from method IV | 3/ |

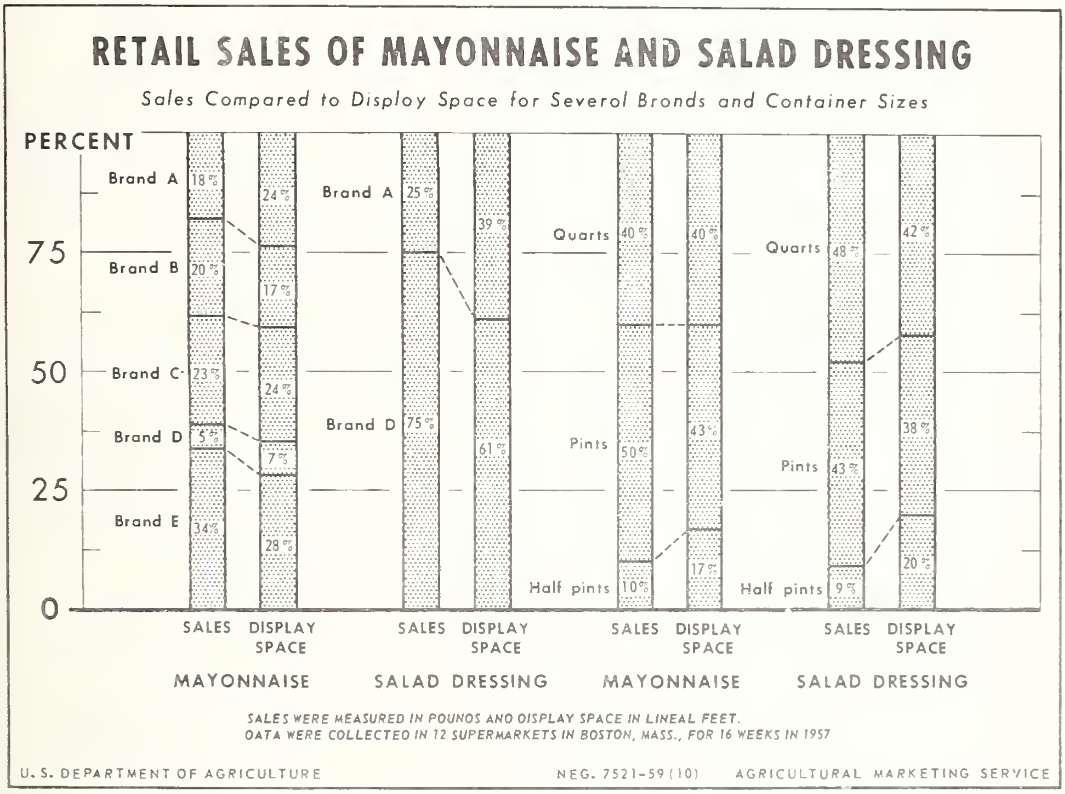
1/ Direct comparisons were made between selected groupings of the 4 merchandising methods tested in order to compare effectiveness of display types having clear similarities.

2/ See figures 1 to 4 for exact arrangement of products in each method.

3/ Not statistically significant at the 20 percent level.

## Retail Movement Related to Display Space [5]

During the experiment, the ratio of total sales of mayonnaise and salad dressing to display space occupied was exactly 1 to 1. That is, mayonnaise occupied 63 percent of the total lineal feet of display area and accounted for 63 percent of the total pounds moved. Similarly, salad dressing occupied 37 percent of the total lineal feet of display area and accounted for 37 percent of the total pounds moved. However, among brands of the two products this ratio was not consistent (fig. 5). For example, brand A mayonnaise occupied 24 percent of the total mayonnaise display space, but accounted for only 18 percent of total mayonnaise sold. In contrast, brand E mayonnaise occupied only 28 percent of the display area, but accounted for 34 percent of sales. Brand A salad dressing had 39 percent of the display but only 25 percent of total salad dressing sales; whereas brand D, occupying 61 percent of the display area, accounted for 75 percent of sales.


RETAIL SALES OF MAYONNAISE AND SALAD DRESSING

Sales Compared to Display Space for Several Brands and Container Sizes

SALES WERE MEASURED IN POUNDS AND DISPLAY SPACE IN LINEAL FEET.
DATA WERE COLLECTED IN 12 SUPERMARKETS IN BOSTON, MASS., FOR 16 WEEKS IN 1957

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Figure 5

An appraisal of the display-sales relationship by container sizes revealed that the percentage of salad dressing sold in quarts exceeded that of the display space occupied, while a 1-to-1 ratio existed between quart sales and display space for mayonnaise. Pint sales of both mayonnaise and salad dressing exceeded the percentage of space occupied. However, half pints of each commodity occupied twice as much space as their percentage share of sales (fig. 5).

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[5] The data in this and the following section represent sales during the 16-week test period under normal store operating conditions and without the benefit of any advertising or promotion.

It is not possible from these data to conclude what ratio of display space to sales is most desirable. The results strongly indicate, however, that research is needed to determine the optimum balance between space and sales for selected major food groups. Through such research, retailers can make more efficient use of the available display space.

## Dollar Sales Related to Display Space

During the experiment, mayonnaise accounted for greater average weekly dollar returns per lineal foot of shelf display than salad dressing because of a higher unit price. The gross for mayonnaise was $14.78 per lineal foot compared with $11.99 for salad dressing (table 5). There were, however, wide fluctuations between brands in the relationship of dollar sales to display space. The highest rate of dollar sales per lineal foot of shelf space for mayonnaise was $19.38, accounted for by brand E. Brand A showed the lowest return, with $10.40 per foot. For salad dressing dollar sales varied from $15.12 per lineal foot for brand D to $7.06 for brand A. A small part of this difference was due to the differences in unit price.

Table 5.--Dollar sales per lineal foot of shelf space for mayonnaise and salad dressing by brand, 12 supermarkets, Boston, Mass., 16-week merchandising test in 1957

| Commodity and brand | Average display per store | Average weekly sales per lineal foot |
|---|---|---|
| | Lineal feet | Dollars |
| Mayonnaise: | | |
| Brand A | 2.87 | 10.40 |
| Brand D | .88 | 10.25 |
| Brand B | 1.99 | 13.98 |
| Brand C | 2.84 | 15.71 |
| Brand E | 3.26 | 19.38 |
| Total | 11.84 | --- |
| Average | --- | 1/ 14.78 |
| Salad dressing: | | |
| Brand A | 2.73 | 7.06 |
| Brand D | 4.30 | 15.12 |
| Total | 7.03 | --- |
| Average | --- | 1/ 11.99 |
| Grand total | 18.87 | --- |
| Average | --- | 1/ 13.74 |

1/ Weighted average.

An analysis was also made by container size. The findings indicate that sales of mayonnaise in pint containers resulted in the highest return with better than $18 per lineal foot. Quarts returned around $13 and half pints less than $11 per lineal foot of shelf space (table 6). A similar pattern was noted for salad dressing with nearly $15 per lineal foot for pints, $12 for quarts, and only about $6.50 for half pints.

Table 6.--Dollar sales per lineal foot of shelf space for mayonnaise and salad dressing by container size, 12 supermarkets, Boston, Mass., 16-week merchandising test in 1957

| Commodity and container size | Average display per store | Average weekly sales per lineal foot |
|---|---|---|
| | Lineal feet | Dollars |
| Mayonnaise: | | |
| Quart | 4.71 | 12.57 |
| Pint | 5.12 | 18.35 |
| Half pint | 2.01 | 10.84 |
| Total | 11.84 | --- |
| Average | --- | 1/ 14.78 |
| Salad dressing: | | |
| Quart | 2.94 | 12.25 |
| Pint | 2.64 | 14.69 |
| Half pint | 1.45 | 6.56 |
| Total | 7.03 | --- |
| Average | --- | 1/ 11.99 |
| Mayonnaise and salad dressing: | | |
| Quart | 7.65 | 1/ 12.45 |
| Pint | 7.76 | 1/ 17.10 |
| Half pint | 3.46 | 1/ 9.05 |
| Grand total | 18.87 | --- |
| Average | --- | 1/ 13.74 |

1/ Weighted averages.

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